## TITLE OF THE INVENTION

CALF, ANKLE, FOOT, OR LEG REST DEVICE FOR CANE AND CANE WITH DEVICE ATTACHED

## CROSS REFERENCE TO RELATED APPLICATIONS

The Present Non-Provisional Patent Application is being filed pursuant to 35 U.S.C. §371 as a US National Stage Patent Application deriving from PCT International Application No. PCT/US 06/24035 filed on June 22, 2006 under the Patent Cooperation Treaty which is the non-provisional counterpart to US Provisional Application Serial Number 60/597,177 filed on November 17, 2005 and US Provisional Application Serial Number 60/743,077 filed on December 25, 2005. The Present National Stage Application PCT Application claims the benefit of and priority to the PCT Application ant to both US provisional applications cited herein.

## BACKGROUND OF THE INVENTION

Many people who either have a permanent leg, knee, or foot disability or are recovering from a leg, knee, or foot operation are required to keep their leg in a horizontal position while seated. These people usually rest a leg on a chair or a hassock. Using a chair for this purpose often creates great discomfort. A hassock is more comfortable than a chair, but it is not very portable. There is a need for an easy to use portable device that would allow a disabled person to comfortably position his or her leg.

## SUMMARY OF THE INVENTION

The invention disclosed herein is a calf, ankle, foot, or leg rest device which can be snapped onto a cane for use or snapped off when only the use of the cane is desired. The invention also encompasses the combination cane and rest device. The rest device is a J-shaped soft padded bracket that is rigidly attached to the cane. The height of the bracket along the cane is adjustable to provide comfort and ease of use. The cane may be positioned at a convenient horizontal distance from the user as desired. In this way, the user may rest his or her calf, ankle, or heel on the rest device. Once the rest device is engaged by

the user's leg, the cane is perfectly balanced on the ground. A user can comfortably keep his leg in a horizontal position for hours.

The First US Provisional Application Serial Number 60/597,177, filed on 17 November 2005, disclosed a detachable resting device which is fastened to a cane. The resting device is able to accommodate a persons calf, ankle, foot, or leg, and to maintain it in a horizontal position. The Second US Provisional Application Serial No. 60/743,077, filed on 25 December 2005, disclosed certain improvements to the invention disclosed in the First Provisional Application.

The first improvement is a J-shaped resting device wherein the bottom part of the "J" is hinged to the vertical stem of the "J." Ordinarily, the bottom part of the "J" protrudes horizontally. However, the improved resting device allows the bottom part to be moved into a vertical position to make using the cane more convenient when the user is walking.

The second improvement to the resting device described above is to the mechanism that mounts the resting device to the cane.

The third improvement to the resting device described above is to the soft padding that cushions the user's calf, ankle, foot, or leg.

The fourth improvement to the resting device described above is that the linear dimension of the bottom part of the "J" may be changed to accommodate a larger size calf, ankle, foot, or leg.

The fifth improvement is to the cane itself. Disclosed herein is a separate detachable quad cane base that can replace the standard single cane tip.

The sixth improvement is also to the cane itself. Disclosed herein is a cane wherein the cane grip doubles as the resting device.

The seventh improvement is the use of two identical resting devices mounted opposite to each other on the cane. This creates a cane whereby a user may elevate both legs to a horizontal position.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is an isometric view of the cane showing the calf, ankle, foot, or leg rest positioned using mounting holes located on the opposite side of the cane. The mounting holes in the rear of the cane are visible.

FIG. 2 is an isometric view of the cane rotated 90° counter-clockwise from FIG. 1 about the longitudinal axis of the cane.

FIG. 3 is a partially exploded isometric view of the cane showing the calf, ankle, foot, or leg rest separated from the cane.

FIG. 4 is an isometric view showing details of the calf, ankle, foot, or leg rest.

FIG. 5 is an isometric exploded view of the calf, ankle, foot, or leg rest.

FIG. 6 is an isometric front view showing the inner layer details of construction of the calf, ankle, foot, or leg rest.

FIG. 7 is an isometric front view showing the outer layer details of construction of the calf, ankle, foot, or leg rest.

FIG. 8 is a front cross section view showing details of construction of the calf, ankle, foot, or leg rest.

FIG. 9 is an isometric side cross section view showing details of construction of the calf, ankle, foot, or leg rest.

FIG. 10 is a front isometric view of the cane showing the mounting bracket to which the calf, ankle, foot, or leg rest resting device is attached.

FIG. 11 shows a user resting his or her calf on the resting device.

FIG. 12 shows the rest assembly adjusted to its center position on its slotted track.

FIG. 13 shows the rest assembly adjusted to its upper-most position on its slotted track.

FIG. 14 shows the rest assembly adjusted to its upper-most position on its slotted track.

FIG. 15(a) is a left side isometric view of a cane with a hinged resting device mounted thereto. The resting device is extended horizontally in the "upright" (use) position.

FIG. 15(b) is a left side isometric view of the cane with the resting device is in the "flat down" position.

FIG. 15(c) is a left side isometric view of the resting device.

FIG. 15(d) is a left side view of the cane with the resting device in the "upright" (use) position.

FIG. 15(e) is a left side view of the cane with the resting device in the “flat down” position.

FIG. 16(a) shows the resting device without soft pads.

FIG. 16(b) shows the back pad of the resting device.

FIG. 16(c) shows the lower pad of the resting device.

FIG. 16(d) shows the resting device with the soft pads.

FIG. 17(a) shows the back pad of the resting device.

FIG. 17(b) shows the lower pad of the resting device.

FIG. 18(a) shows the resting device in the standard width position.

FIG. 18(b) shows the resting device in the wide width position.

FIG. 19 shows the use of a detachable quad cane base.

FIG. 19(a) shows how the quad cane base attaches to the cane.

FIG. 19(b) shows a more detailed view of the base.

FIG. 20 shows a special cane where the cane hand rest doubles as the foot rest.

FIG. 20(a) shows the resting device mounted as the cane hand rest.

FIG. 20(b) shows the hand rest detaching from the cane.

FIG. 20(c) shows the cane itself without the resting device.

FIG. 20(d) shows the cane with the mounted foot rest.

FIG. 21 shows a cane with two resting devices mounted on opposite sides of the cane.

FIG. 22 shows a version of the resting device without soft pads that attaches to a standard cane.

FIG. 22(a) shows the resting device in the standard width position and in the “upright” position..

FIG. 22(b) shows the resting device in the wide width position and in the “upright” position.

FIG. 22(c) shows the resting device in the “flat down” position.

FIG. 23 shows the resting device of FIG. 22 with soft pads.

FIG. 23(a) shows the resting device in the standard width position and in the “upright” position..

FIG. 23(b) shows the resting device in the wide width position and in the "upright" position.

FIG. 23(c) shows the resting device in the "flat down" position.

FIG. 24 suggests how the resting device of FIG. 23 would attach to a standard cane.

FIG. 25(a) shows standard width horizontal and vertical soft pads together.

FIG. 25(b) shows wide width horizontal and vertical soft pads together.

FIG. 26 shows soft pads that attach to the resting device with Velcro™.hook-and-loop attachment strips.

FIG. 26(a) shows the mounting of the attachment strip on the rear surface of the vertical soft pad.

FIG. 26(b) shows the front surface of either the horizontal or vertical soft pad.

FIG. 26(c) shows the mounting of the attachment strip on the rear surface of the horizontal soft pad.

FIG. 26(d) shows the mating attachment strips mounted on the resting device in the "upright" position.

FIG. 26(e) shows the mating attachment strips mounted on the resting device in the "flat down" position.

**DETAILED DESCRIPTION OF THE INVENTION**

The invention disclosed herein is a calf, ankle, foot, or leg rest device (hereinafter, Resting Device) and a cane modified by having the Resting Device movably mounted thereon. FIG. 1 is an isometric view of the cane showing the Resting Device positioned using mounting holes located on the opposite side of the cane. The mounting holes in the rear of the cane are visible. FIG. 2 is an isometric view of the cane rotated 90° counter-clockwise from FIG. 1 about the longitudinal axis of the cane. Referring to Figures 1 and 2, the basic cane comprises a hand grip, 1; an upper cane section, 2; cane height adjustment holes, 8, through which a spring driven snap button protrudes thereby locking in the desired height; a lower adjustable extension section, 10, containing one spring driven snap button to lock in the desired cane height by snapping the

button outward through one of the holes in the upper cane section; a knurled cam nut, 9, which is tightened once the desired height is reached; and a cane tip, 11. The cane tip is shown in one standard configuration. Other cane bottoms may be used. For example, the bottom of the cane can have a rubber-tipped four pronged balancing device. Similarly, the cane hand grip, 1, is shown in one standard configuration. However, any desired hand grip may be used in its place. The improvement to this cane comprises the Resting Device assembly which further comprises a padded foot rest section, 6; a slotted track, 3, onto which the foot rest base section may be lowered or raised; a foot rest base section, 4, which interlocks onto the slotted track, 3; an upper adjustable tightening knob, 5, which locks in the desired upper or lower position of the foot rest; and a lower adjustable tightening knob, 7, which performs the same function as the upper knob, 5.

The Resting Device is detachable, and it can be snapped onto the cane when it is needed, or it can be snapped off when only the use of the cane is needed. Usually, when a user sits in a chair, the Resting Device is attached to the cane, and the user rests his or her calf, ankle, foot, or leg on the padded portion of the foot rest. The height of the Resting Device is adjustable for maximum comfort. While the Resting Device is in use, the cane is self standing and perfectly balanced, and the user is extremely comfortable. It can be used in this way for very long periods of time.

FIG. 3 is an isometric view showing the Resting Device detached from the cane. FIG. 4 is an isometric view showing details of the Resting Device assembly, while FIG 5 is an exploded view of the Resting Device assembly. Referring to FIG. 3, it can be seen that the entire Resting Device assembly attaches to a permanent receptor or mounting bracket which is a part of the cane. The relationship of the mounting bracket 15 to the cane is shown more clearly in FIG. 10. FIG. 4 shows the Resting Device in clearer detail. The slotted track 3, upper adjustment knob 5, the padded calf, ankle, foot, or leg rest 6, and the lower adjustment knob 7 are visible in the drawing.

Figures 6 and 7 show details of the construction of the foot rest. FIG. 6 shows an underlayer of soft padding 12 covering the extended portion of J-shaped bracket 13 which is mounted to a fastening plate by conventional fasteners. The padding could be fabricated from a soft material such as foam rubber or memory foam, for example. The soft material is chosen upon which a foot, ankle, calf, or leg may rest comfortably. FIG. 7 shows the soft padding and all or part of the J-shaped bracket is covered by a durable material 14 (such as extra strength nylon cloth) which takes the shape of the foot rest as shown. FIG. 8 is a front cross sectional view showing the construction details. FIG. 9 is an isometric side cross sectional view also showing the construction details.

FIG. 11 is an isometric view showing a person resting his or her calf upon the Resting Device. Depending upon the desired positioning of the cane, it should be apparent that one may rest his or her ankle or heel upon the resting device also. The height of the Resting Device may be adjusted in three ways. First, referring to FIG. 1, knurled knob 9 may be used to adjust the overall height of the cane body 2 and handle 1 relative to the ground. Second, there is a series of positioning holes 8 in the cane body 2 for positioning mounting bracket 15 (see FIG. 10) so as to make it a part of the cane. The Resting Device assembly is then attached to and held in a fixed position relative to the mounting bracket. Finally, the position of the foot rest 4 may be adjusted within the length of slotted track 3. FIG. 12 shows the rest assembly adjusted to its center position on its slotted track. FIG. 13 shows the rest assembly adjusted to its upper-most position on its slotted track. Finally, FIG. 14 shows the rest assembly adjusted to its upper-most position on its slotted track.

While the cane described thus far serves the purpose of allowing the user to elevate his or her leg in a horizontal position, walking with the cane while the resting device is mounted could be inconvenient for the user. First, the resting device protrudes from the cane causing it to possibly bump into objects and other people in crowded places. Second, a user might consider a protruding resting device unsightly. The improvement to the resting device is shown in FIG. 15.

FIG. 15(a) is a left side isometric view of a cane with the resting device mounted thereto. The right side is a mirror image of the left side. The resting device is in the extended position or the "upright" (use) position. When the resting device is extended, a user may maintain his or her leg in a horizontal orientation. A tightening wing 16 nut is provided for positioning the resting device vertically. A locking ratchet mechanism is provided to lock the resting device 17 in an extended or "flat down" position. Bolt and wing nut assembly 18 is also provided for tightening the resting device into position. FIG. 15(b) shows a similar view of the cane, but this time, with the resting device in the collapsed of "flat down" position. In this position, the bottom part of the "J" is parallel to the cane body and rests against the cane. It does not protrude. FIG. 15(c) shows the resting device fitting over a standard cane. Almost all standard canes (except for wooden canes) come with a snap button 20. The resting device slides over the cane body to the desired height up to the snap button which stabilizes and locks the resting device. FIG. 15(d) and FIG. 15(e) are left side views of the cane with the resting device mounted as described above. A locking ratchet mechanism 19 is provided to lock the resting device into the desired position. FIG. 15(d) shows the position of the resting device while in use, while FIG. 15(e) shows the position of the resting device while not in use.

FIG. 16 shows two improvements to the resting device over that disclosed in the First Provisional Application. The first improvement is the wing nut and bolt locking mechanism that fixes the vertical position of the resting device on the cane. Bolt and nut assemblies 22 attach the resting device to the cane attachment frame. 21. The wing nut locking assemblies attach the attachment frame to the cane. Each resting device would have two such locking assemblies. The second improvement is the use of detachable cushion pads -- a back pad that mounts vertically onto the resting device and a lower pad that mounts horizontally on the resting device. The pads screw onto the resting device and are held in place with two nuts. FIG. 16(a) shows the resting device without the pads. FIG. 16(b) and FIG. 16(c) show the pads 23 and 25 themselves, respectively, which in turn, screw on to the resting device using screws and nuts

24 and 26. FIG. 16(d) shows the resting device with the mounted pads. FIG. 17 shows a more detailed view of the pads. Note the wing nut locking assemblies 27. FIG. 17(a) shows the back pad while FIG. 17(b) shows the lower pad.

FIG. 18 shows another improvement to the resting device. In the First Provisional Application, the resting device was shown where the length of the bottom part of the "J" was fixed. To accommodate different sizes, different sized resting devices would need to be available. However, the bottom part of the "J" could be made adjustable. FIG. 18(a) shows the bottom part pushed-in to accommodate a standard width. This configuration would utilize a standard size lower pad 28. FIG. 18(b) shows the bottom part pulled-out to accommodate a larger size leg, calf, foot, or ankle. This configuration would utilize a larger size lower pad 29.

Some people need greater stability when they use a cane for walking. While a standard cane 30 would come with a single rubber tip, that tip could be removed and replaced with a detachable quad cane base 31. The quad cane base is attached to the cane using tightening knob 32. This configuration is shown in FIG. 19(a). FIG. 19(b) shows a more detailed view of the quad cane base.

FIG. 20 shows a special cane where the hand grip doubles as the resting device. FIG. 20(a) shows the cane in the configuration where the resting device is the hand grip 33. The hand grip outer surface 34 would be preferably made from hard rubber while the inner surface 36 would be preferably made from foam rubber covered by a stretched vinyl cloth. Attached to the handle, as shown, is a flexible steel cable 35. A height adjustment rack 38 screws onto the cane shaft. 37 The adjustment rack has a plurality of protrusions that aim upwards and outwards at an angle to the cane shaft. FIG. 20(b) shows that the hand grip 33 unscrews from the top of the cane shaft. FIG. 20(c) shows the cane shaft without the hand grip. In FIG. 20(d), the hand grip 33 becomes the foot resting device. The flexible steel cable holds the resting device in a fixed position relative to the cane. A small hand grip 39 screws onto the cane shaft after the resting device is attached.

Finally, some users might want to elevate both legs in a horizontal position. This may be accomplished using two resting devices mounted on opposite sides of the cane shaft as shown in FIG. 21. Both resting devices have adjustment screws 40 that can shift the positions of the devices on the cane shaft.